

Application No. 09/589,299
Filed: June 7, 2000
TC Art Unit: 2677
Confirmation No.: 9186

REMARKS**BEST AVAILABLE COPY**

Applicant thanks the Examiner for the indication of allowable subject matter in claims 13-20, 28-35 and 39-41.

A. Independent claim 1 and claims dependent therefrom.

Claims 1-7, 9-11, 28-29, and 37 have been rejected under 35 U.S.C. § 103(a) over Amafuji et al. (US 6,292,158 B1) in view of Rallison et al. (US 5,949,583). Reconsideration of this rejection is respectfully requested.

The Response to Arguments section in the office sets forth the following: "In response to applicant's argument that the replacement of Amafuji's off-axis system with Rallison's on-axis system would create a weight problem, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art." (Office Action, pp. 17-18).

In the present case, Applicant has given substantive reasons why the combined teachings of the references do not suggest the combination. A reiteration of the test for obviousness does not address the substance of those reasons. In summary, Applicant noted that the system of Amafuji could not simply be "replaced" with the system of Rallison, as the Examiner asserts, because substantial reconstruction would be needed, and neither reference teaches how such a reconstruction would be made.

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As set forth previously, an axial system such as Rallison's requires an eyepiece in front of the face. Such a system is generally characterized by more weight suspended in front of the face. If the weight is high, the center of gravity (CG) is located too far forward, which is a problem. It also might present a safety hazard to the eye. A non-axial system such as that of Amafuji obviates these problems. In a non-axial system, the optically complex system is moved away from the face. However, it is found in practice that the total weight of such a system is still high. Also, despite the center of gravity disadvantages, axial systems have far less distortion than non-axial systems.

The present invention provides an axial system that reduces the total weight, which is not an obvious task. Claim 1 recites a head-mountable support fixture comprising an elongated member having a first end and a second end. The projection system is attached at the first end of the elongated member of the support fixture and that the eyepiece assembly is attached to the second end of the elongated member of the support fixture.

The Rallison axial system does not employ an elongated member having a projection system attached at one end and an eyepiece assembly attached at an opposite end, as claimed by Applicant and acknowledged in the office action (Final Office Action, p. 23). The office action does not, however, explain how the Rallison axial system would be employed in the Fig. 5 embodiment of Amafuji, other than by a "replacement."

More particularly, Rallison discloses an image generator 2 mounted in a visor arrangement to extend outwardly from the forehead area of the wearer. See Figs. 3 and 4. An optical path 6 from the image generator extends downwardly to a fold mirror 1 and

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outwardly to a reflective combiner 4, where it is then reflected back toward the eye. One of skill in the art would not try to rearrange the optical components of Rallison to place the image generator on one end of an elongated member and the optical components on the other end or to fit these components into the embodiment of Amafuji's Fig. 5, which is mounted on the side of the user's head. There is no teaching in Amafuji or Rallison as to how one of skill in the art would modify the Fig. 5 embodiment of Amafuji into an axial system. In any event, substantial reconstruction would be required to do so, more than a mere "replacement." Accordingly, claim 1 and the claims dependent therefrom are believed to be patentable over Amafuji in view of Rallison.

B. Independent claim 21 and the claims dependent therefrom.

Claims 21-25, 28-29, and 43 have been rejected under § 103(a) over Amafuji in view of Fritz (US 5,838,490). Reconsideration and withdrawal of this rejection is respectfully requested for the following reasons.

Amafuji has been cited for disclosing a compact display device 201 for transmitting an image to a user's eye. Fritz has been cited for teaching a Mangin mirror.

Fritz discloses an optical system suitable for use in a helmet by an aircraft pilot. (Col. 1, lines 46-52) Fritz discloses a Mangin mirror 35 and an image source 12, which is located generally in front of the eye at the exit pupil plane 50. There is no teaching in Fritz as to how to incorporate such an optical system into the different form of display system taught by Amafuji, in which the image source is moved to the side of the

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head. For example, if the image source 12 of Fritz were located at the display unit 204a of Amafuji, the image would not be directed to the user's eye. Thus, there is no teaching to combine Fritz with Amafuji.

The present invention teaches the use of a modified Mangin mirror in a compact display device. Claim 21 recites that the support fixture maintains the projection system and the eyepiece assembly in alignment along an optical path through free space, with the projection system disposed to transmit the image on the optical path and the eyepiece assembly disposed to receive the image from the projection system and to direct the image to the user's eye. Also, claim 21 recites that the eyepiece assembly comprises a non-axial optical system including a modified Mangin mirror.

As with claim 1 above, one of skill in the art would not try to rearrange the optical components of Fritz to place the image source on one end of an elongated member and the optical components on the other end or to fit these components into the embodiment of Amafuji's Fig. 5, which is mounted on the side of the user's head. There is no teaching in Amafuji or Fritz as to how one of skill in the art would modify the Fig. 5 embodiment of Amafuji to incorporate the optical system of Fritz. Accordingly, claim 21 and the claims dependent therefrom are believed to be patentable over Amafuji in view of Fritz.

C. Remaining dependent claims.

Claim 8 has been rejected under § 103(a) over Amafuji and Rallison and further in view of Taniguchi et al. (US 6,023,253). This claim is believed to be patentable for the reason set forth

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with respect to claim 1 and no further comment thereon is believed necessary at this time.

Claim 12 has been rejected under § 103(a) over Amafuji and Rallison and further in view of Ronzani et al. (US 5,844,656). This claim is believed to be patentable for the reason set forth with respect to claim 1 and no further comment thereon is believed necessary at this time.

Claims 26-27 have been rejected under § 103(a) over Amafuji and Fritz and further in view of Ronzani. These claims are believed to be patentable for the reasons set forth above with respect to claim 21, and no further comment thereon is believed necessary at this time.

Claims 30-32 have been rejected under § 103(a) over Amafuji and Rallison in view of Lebby et al. (US 5,469,185). Claims 30-32 have also been rejected under § 103(a) over Amafuji and Fritz in view of Lebby. These claims are believed to be patentable for the reasons set forth above with respect to claims 1, 13, or 21, and no further comment thereon is believed necessary at this time.

Claims 33-35 have been rejected under § 103(a) over Amafuji and Rallison in view of Fan et al. (US Pat. No. 5,815,126). Claims 33-35 have been further rejected under § 103(a) over Amafuji and Fritz in view of Fan. These claims are believed to be patentable for the reasons set forth above with respect to claims 1, 13, or 21, and no further comment thereon is believed necessary at this time.

Claim 36 has been rejected under § 103(a) over Amafuji and Rallison in view of Newman et al. (US 5,844,824). This claim is believed to be patentable for the reasons set forth above with

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respect to claim 1, and no further comment thereon is believed necessary at this time.

Claim 38 has been rejected under § 103(a) over Amafuji and Rallison in view of Horiuchi (US 6,304,234 B1). This claim is believed to be patentable for the reasons set forth above with respect to claim 1, and no further comment thereon is believed necessary at this time.

Claim 42 has been rejected under § 103(a) over Amafuji and Fritz in view of Newman. This claim is believed to be patentable for the reasons set forth above with respect to claim 21, and no further comment thereon is believed necessary at this time.

Claim 44 has been rejected under § 103(a) over Amafuji and Fritz in view of Horiuchi. This claim is believed to be patentable for the reasons set forth above with respect to claim 21, and no further comment thereon is believed necessary at this time.

D. Conclusion


In view of the above amendment and remarks, all claims are believed to be in condition for allowance, and reconsideration and indication thereof are respectfully requested. The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite prosecution of the present application.

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The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,

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